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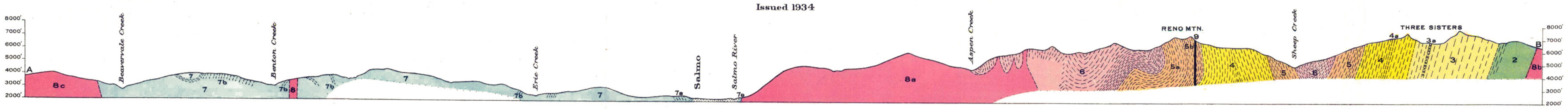
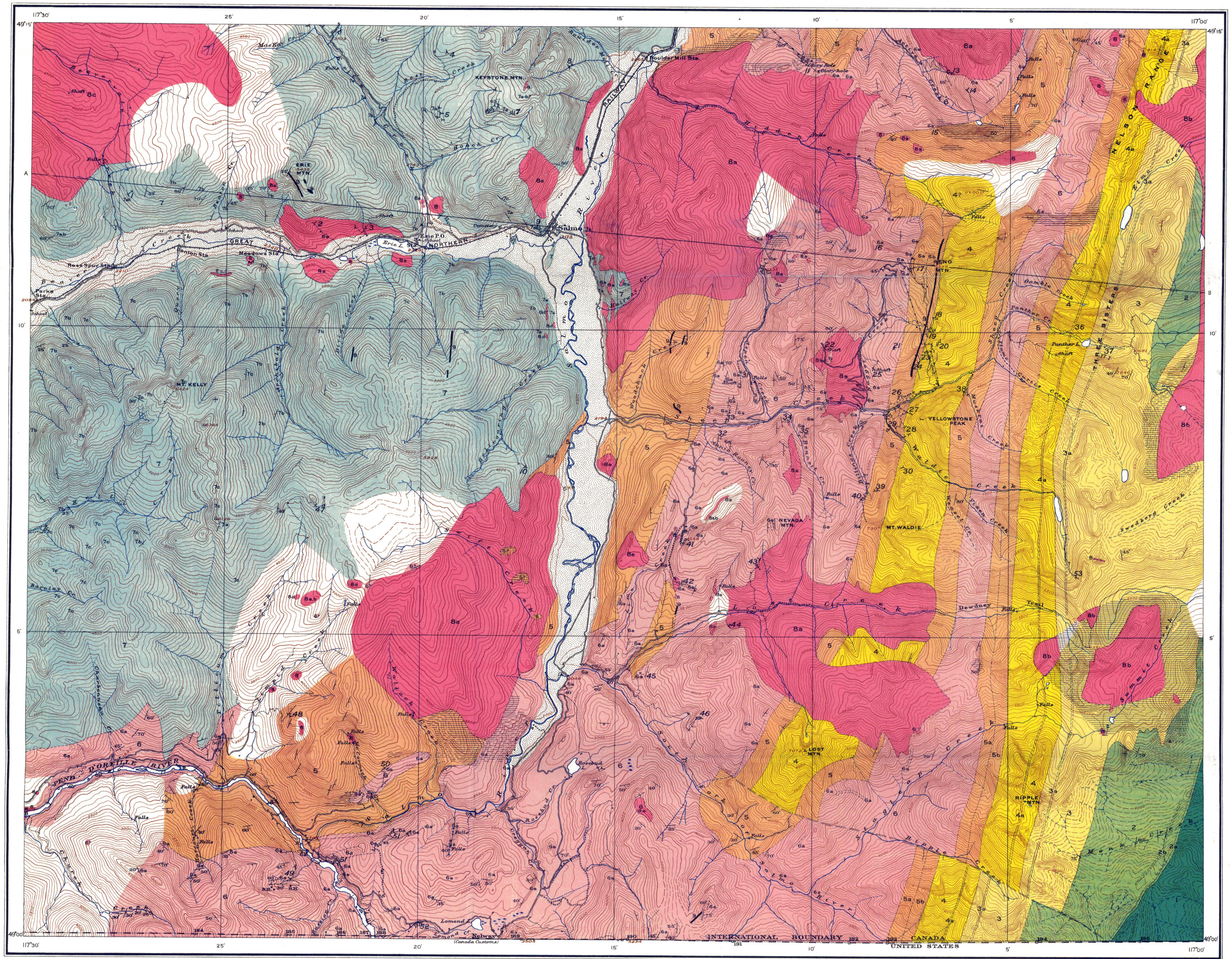


Structural section along line A B



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LEGEND

RECENT AND PLEISTOCENE

Recent alluvium and glacial deposits

MESOZOIC

POST-TRIASSIC

9 — *Aplite dykes and sills (numerous isolated outcrops and smaller bodies are omitted)*

8 — **NELSON BATHOLITH** *Granite, 8a; granodiorite, 8b; quartz diorite, 8c; syenite, 8d; monzonite, 8e*

TRIASSIC (?)

7 — **BEAVER MOUNTAIN-ROSSLAND GROUP** *Latite, andesite and greenstone flows, dykes and sills; argillaceous sediments and locally limestone, 7a; tuffs, 7b; breccias, 7c*

LATE PRECAMBRIAN

WINDERMERE

6 — **PEND-D'OREILLE SERIES** *Phyllite, argillaceous quartzite; limestone, 6a*

5 — **RENO** *Quartzites, 5a; limestone, argillite and quartzite, 5b*

4 — **QUARTZITE RANGE** *Quartzite; argillaceous quartzite and argillite member, 4a*

3 — **THREE SISTERS** *Grit, fine conglomerate, quartzite; boulder conglomerate member, 3a*

2 — **HORSETHIEF CREEK SERIES** *Argillite with interbeds of limestone and grit; boulder conglomerate member, 2a; limestone member, 2b*

1 — **IRENE VOLCANICS (?)** *Massive and sheared greenstone*

Symbols

Geological boundary (position defined)
Geological boundary (position approximate)
Fault (position approximate)
Bedding (inclined or overturned, vertical, horizontal)
Areas of numerous granitic dykes, strata in part much altered

Note:- *Areas left uncoloured and not stippled lack outcrops and the nature of the bedrock is uncertain.*

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51 Reeves-McDonald Mines, Ltd.
52 International Lead and Iron
53 Wolf Lake

Geology by J. F. Walker, 1928, 1929, and 1931.

DESCRIPTIVE NOTES

The upland topography is more mature than would be expected in an area possessing so great (4,000 feet) a vertical relief and it is evident that the deepening of the valleys occupied by the larger streams must have taken place as a result of comparatively late (Tertiary) regional uplift. Evidence of continental glaciation is everywhere presented by transported materials and by erratics, but subsequent valley glaciation appears to have been on a comparatively small scale. The rock canyon of the Pend-d'Oreille river is of recent date.

The IRENE VOLCANIC (?) FORMATION (1) consists of massive, and sheared greenstones, and is well exposed on the high ridges immediately east of the sheet, south of Monk creek, but is largely covered within the area. The greenstones present no evidence of being extrusives.

The HORSETHIEF CREEK SERIES (2) is the oldest sedimentary formation within the map-area and is 4,000 feet or somewhat less thick. The lowest member is a prominent band of boulder conglomerate (2a) about 200 feet thick, composed of ill-assorted, angular fragments of limestone and quartzite in an essentially argillaceous matrix. A 200-foot band of limestone (2b, shown only where observed) lies about 900 feet above the conglomerate. The remaining greater part of the series is poorly exposed. It consists chiefly of argillite of varying shades of grey and brown, grading to slaty and schistose beds. Some beds of grit occur in the upper part of the series.

The THREE SISTERS FORMATION (3) conformably succeeds the Horsethief Creek series. The lower part is composed of massive, greenish-grey quartz grit or fine conglomerate exhibiting little evidence of bedding, and breaking down into huge angular blocks on the high summits. A thin bed of slate occurs about the middle. The lower part is 2,000 feet thick and is succeeded by: 450 feet of alternating beds of grit and white quartzite; about 1,700 feet of grey, gritty quartzites with an argillaceous bed about the middle of the group; 100 feet of boulder conglomerate (3a); and, forming the top of the formation, about 1,150 feet of gritty quartzites and fine grit.

The QUARTZITE RANGE FORMATION (4) conformably overlies the Three Sisters formation. The lower 1,600 feet of the formation is essentially massive, white quartzite in beds up to 4 feet and more in thickness. A band (4a) of argillaceous quartzite, and slaty argillite up to 200 feet in thickness succeeds the white quartzites and forms a distinctive horizon marker. About 1,100 feet of white, crumbly quartzites, and massive, hard, white quartzites overlie the argillaceous member, and are overlain by about 1,500 feet of white quartzite, faintly tinged with green or grey, with a few thin interbeds of slate.

The RENO FORMATION (5) conformably succeeds the Quartzite Range formation. The lower part (5b) with a maximum thickness of about 1,600 feet, consists of white to grey argillaceous quartzite grading upwards into siliceous argillites that in turn grade upwards into limy argillaceous beds, limestone, and calc schists. The upper limit of this lower part is, wherever possible, indicated on the map.

The upper part (5a) of the formation is essentially grey quartzite, and has a maximum thickness at Reno mountain of about 1,900 feet. This upper part, like the Quartzite Range formation is, because of its brittle character, favourable to the formation of fissure veins.

The PEND-D'OREILLE SERIES (6) conformably succeeds the Reno formation and is the youngest member of the Precambrian within the area. The series is composed chiefly of dark grey to black phyllites. In the lower part of the series the phyllites grade into beds of dark grey, almost black quartzites, and four well-defined limestone horizons (6a, shown only where observed) are present. The phyllites are in places highly carbonaceous and where greatly sheared give rise to graphitic schists. The series has acted as a weak unit during mountain building, and consequently is highly folded and contorted. The important members of the series are the limestone horizons in the lower part in which zinc and lead-zinc replacement deposits are found. The thickness of the series is unknown.

The BEAVER MOUNTAIN-ROSSLAND GROUP (7) is presumably unconformable to the Pend-d'Oreille series but the relationships are not definitely known. The lower part of the group is largely composed of ash rocks, argillite, and gradations between them whereas the upper part consists mainly of flows of latite and andesite. Beds of ash rocks, argillite, and breccias also occur in the upper part, and dykes and sills of latite and andesite in the lower part. Limestone beds (7a) occur in several localities; possibly they should not be included in this group. The age of the group is not definitely known but is presumed to be Triassic.

The NELSON BATHOLITH (8) rocks vary considerably in composition and appearance. They are younger than the Triassic (?) and older strata into which they have sent numerous aplite dykes and, locally, they have intensely altered the sedimentary strata. The common rock type is a medium to coarse-grained, light-coloured, generally porphyritic granite (8a) in which flesh coloured orthoclase, quartz and some biotite are readily recognized. Grey granodiorite (8b) and black and white quartz diorite (8c) are less common but occupy large areas. Several stocks are composed of dark syenite (8d) and monzonite (8e) provisionally grouped with the Nelson batholithic rocks.

APLITE DYKES and SILLS (9) occur throughout the area, and are particularly abundant close to the granite bodies.

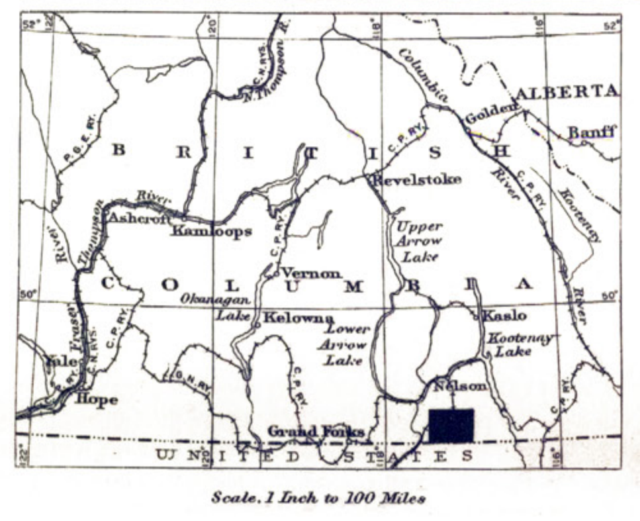
LAMPROPHYRE DYKES cut all other rocks and also the mineral deposits. They are generally fine-grained, dark grey to black rocks, in which biotite and augite phenocrysts are visible. On the whole they are much weathered.

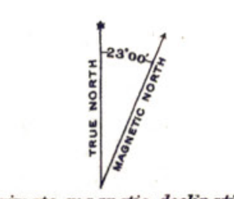
MINERAL DEPOSITS. Mineralization is assumed to be a result of the segregation of the metallic content of the Nelson batholithic magmas. This segregation presumably took place at a late stage in the cooling and crystallization of the Nelson batholithic rocks. The mineralizing solutions ascended through fissures, and openings in the strata forming the roofs of the granitic bodies and where conditions were favourable, deposited their metallic content and gave rise to deposits of varying shape, size, and value. Most of the deposits are either gold-bearing fissure deposits in which base metals are of minor importance or lacking, or replacements of limestone valuable for their zinc and lead contents but lacking in gold content and with only negligible amounts of silver. They occur in fairly well-defined belts that correspond to the distribution of brittle quartzite formations and limestone. The gold deposits are found chiefly between Reno and Waldie (Vernon) mountains in fissures cutting the Quartzite Range formation, and the upper part of the Reno formation. A few veins along the sides of dykes cutting the Three Sisters formation are reported to carry values in silver or gold. Two deposits carry values in gold as well as in base metals and two fissure deposits carry zinc, lead, and silver. Deposits carrying molybdenite occur along the western contact of the Lost Creek granite area, and at the northern end of an isolated exposure of this granite on Bennett creek. Quartz-sulphide veins carrying high gold values occur in the vicinity of Keystone mountain following dykes or sills cutting argillaceous rocks and greenstones of the Beaver Mountain-Rossland group.

The zinc and zinc-lead replacement deposits are in the limestone bands in the lower part of the Pend-d'Oreille series. Structure has played an important part in the formation of this type of deposit and particular attention should be paid to anticlinal folds in the limestone where the massive type of sulphide replacement is more likely to be found. A low grade disseminated type in which zinc constitutes the chief value, is of little importance at present. Deposits of the base metals are unknown in the synclinal trough of Pend-d'Oreille sediments along the eastern side of the area, except near the International Boundary.

The most favourable location for gold fissure deposits is along the anticline of the Quartzite Range and Reno formations extending from Reno ridge to Mount Waldie. The easterly belt of these formations is worthy of some prospecting. The area about Keystone mountain from Erie creek to Salmo river, though heavily covered by overburden, is worthy of careful prospecting.

Oxidation has frequently destroyed the primary sulphide minerals of the gold-bearing fissures to depths anywhere up to 500 to 1,000 feet. In some cases enrichment of the gold values has occurred. The presence of brown iron oxides, and some porosity of the quartz resulting from the removal of the sulphides is almost always an indication of some values in gold.




Approximate magnetic declination

MAP 299 A

SALMO SHEET

KOOTENAY DISTRICT
BRITISH COLUMBIA

Scale, $\frac{1}{63,360}$ or 1 Inch to 1 Mile

Miles
Kilometres

Contour interval 100 Feet
Elevations referred to Mean sea-level

Legend

Road and buildings
Road not well travelled
Bush road or trail
Railway
Mine tramway
Aerial tramway
Mine tunnel
Prospect
Bore-hole B.H.
Tourist camping ground
International boundary
International boundary monument
Triangulation station
Intermittent stream
Lake and stream (position approximate)
Marsh
Rapids
Contours
Contours (position approximate)
Depression contour
Height in feet

Surveys by S. M. Steeves, 1928, 1929, 1930.

RELATED PUBLICATIONS

MAP 1068: Sketch map of Sheep Creek Mining Camp, West Kootenay, British Columbia; scale, 1 inch to 1 mile; by R. A. Daly, 1906, and O. E. LeRoy, 1909.

MEMOIR 38: Geology of the North American Cordillera at the Forty-ninth Parallel; by R. A. Daly, 1912.

MEMOIR 94: Ymir Mining Camp, British Columbia; by C. W. Drysdale, 1917.

SUMMARY REPORT, 1929, PART A: Mineral developments in Salmo map-area, British Columbia; by J. F. Walker.

MEMOIR 172: Geology and Mineral Deposits of Salmo map-area, British Columbia; by J. F. Walker.